Food and Agriculture Organization
of the United Nations

MAXIMIZING NUTRITION IN THE FISHERIES AND AQUACULTURE **SECTOR IN KENYA**

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IN BRIEF

The existing and potential contribution of capture fisheries and aquaculture (including mariculture*) to a country's food security and nutrition can be significant. Fish represents a primary source of protein and essential nutrients, and there is growing recognition of its nutritional and health-promoting qualities. More specifically, fish as an animal source food (ASF) is rich in nutrients, containing a substantial amount of protein, omega-3 fatty acids, minerals (e.g. potassium and calcium), micronutrients (e.g. iron and selenium), fat soluble vitamins (e.g. vitamins A, D, E and K) and water-soluble vitamins such as vitamin B complexes (Khaliki and Sampels, 2018). The need to feed a growing global population and respond to increased demand for fish puts pressure on natural resources and challenges the sustainability of marine and inland fisheries and development of aquaculture. Despite the importance of fish as a resource, to date, there has been limited attention given to the sector's role in contributing to food security and nutrition (FSN) strategies at the national level.

Integrating nutrition into the fisheries food system is critical to addressing the unacceptably high prevalence of malnutrition and micronutrient deficiencies both in Kenya and globally. However, uncertainty over what practical approach to adopt remains a challenge for policymakers and practitioners at all levels due to a lack of proven methodological tools. To help address this challenge the Food and Agriculture Organization of the United Nations (FAO), with support from World Vision (WV), has developed an innovative stepwise approach that combines theory and practice by establishing a **theory of change and associated impact pathways**. This work was carried out as part of a consultative process involving expert stakeholders from Kenya. The results obtained demonstrate the utility of this methodological process in helping political decision-makers and field officers **formulate and evaluate nutrition-sensitive policies, programmes and interventions**.

World Vision

* For the purposes of this brief and its respective guidance note, any reference to aquaculture includes mariculture.

THE KEY STEPS OF THE METHODOLOGICAL PROCESS

STEP 1. SITUATIONAL ANALYSIS

- Scientific literature review
- Identify key participants from the sector in the selected country
- Identify sector challenges using the food system framework
- Validate the situational analysis findings

STEP 2. DEVELOP THE THEORIES OF CHANGE

- Prioritise the challenges to be addressed by the theories of change
- Develop theories of change for each identified priority

STEP 3. DEFINE IMPACT PATHWAYS BASED ON PRACTICAL EXPERIENCES

- Identify the relevant sub-sectors
- Map policies and actions from selected sub-sectors
- Define practice-based impact pathways for each sub-sector based on existing activities

STEP 4. VALIDATION OF THE THEORIES OF CHANGE AND IMPACT PATHWAYS

- Assess critical hypotheses and trade-offs
- Consolidate the theories of change based on the impact pathways
- Provide indicators to measure the expected changes
- Consult stakeholders and validate findings

I. Entry point: a food systems approach

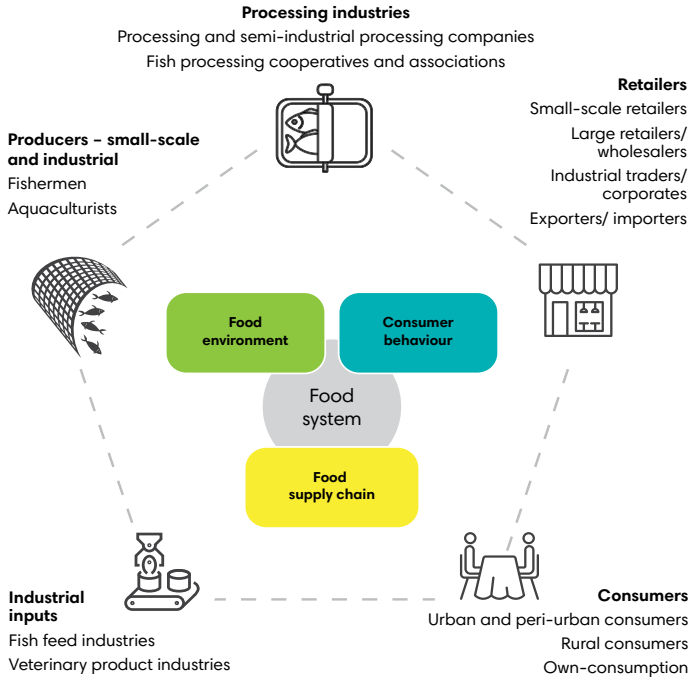
Why is it necessary for the fisheries sector to integrate nutrition into food systems?

In Kenya, 155 500 households are categorized as having poor consumption and 879 000 as having borderline consumption (Kenya National Bureau of Statistics, 2010). Based on an average household size of 3.9 individuals, there are an estimated four million food-insecure Kenyans (Kenya Integrated Household Budget Survey, 2018). Rural Kenyan households are more likely to be food insecure than urban households (14 percent compared to 9 percent). They are typically poor and dependent on daily agricultural labour. Low-income agriculture is the most common type of livelihood. Compared to food-secure households, the food insecure have fewer livestock and less agricultural land and are more likely to be headed by women and the elderly.

Similar to most countries in Africa, Kenya has a much lower animal protein intake than the world average, which partly contributes to the prevalence of food insecurity and malnutrition (Obiero *et al.*, 2019). Moreover, fish's share of total animal protein consumption is much lower in Kenya (8 percent) than the rest of Africa (20 percent) (Cai, 2018). Kenya's most recent National Dietary Survey indicates that the country's fish consumption per capita remains in decline, falling from 6.0 kg to 4.3 kg between 2008 and 2010 (Farm Africa, 2016).* This decline appears to be at least in part due to the increase in the population growth rate (2.8 percent) during the period. The situation is further exacerbated by the low levels of production at Kenya's coastal fisheries, high level of exports from Lake Victoria, and lack of infrastructure impeding higher production at Kenya's other lake fisheries (Manyala, personal communication).

* This is slightly below the average fish and seafood consumption in the East African Community (4.7 kg/capita/year), sub-Saharan Africa (8.6 kg/capita/year) and worldwide (20.2 kg/capita/year). See Rothuis, Turenhout, van Duijn, Roem, Rurangwa, Katunzi, Shoko and Kabagambe (2014) and FAO (2018a)

The key players in the fishery sector and their relation to the three key components of the food system



Source: authors.

II. Identification of challenges and issues in relation to addressing nutrition in the fisheries sector

Carry out a contextual analysis using a food systems approach to prioritize sector specific challenges and issues related to nutrition and to contribute to more diverse diets.

Structural deficits. There has been a consistent structural gap between consumer demand for fish and domestic production. The existing capture fisheries and semi-intensive pond-based fish production systems have not been able to meet the demand for fish in Kenya. With stagnant, even declining fisheries, and a growing population with an increasing appetite for fish, the gap between supply and demand is likely to increase in the future unless substantial levels of production are achieved by adopting intensive fish production systems in a responsible manner.†

† See Obwanga, Soma, Ingasia Ayuya, Rurangwa, van Wonderen, Beekman and Kilelu (2020).

Poverty and food insecurity. Kenya's marginal agricultural communities include remote and pastoralist communities and fishers. In Kenya's very poor fish-producing counties, where the vast majority of heads of households have little or no education, food security is undermined by high food prices and the lack of sufficient cash-generating employment opportunities.

III. Overarching theory of change for the fisheries sector

Establish key assumptions that identify the sectoral changes needed to contribute to more diverse diets.

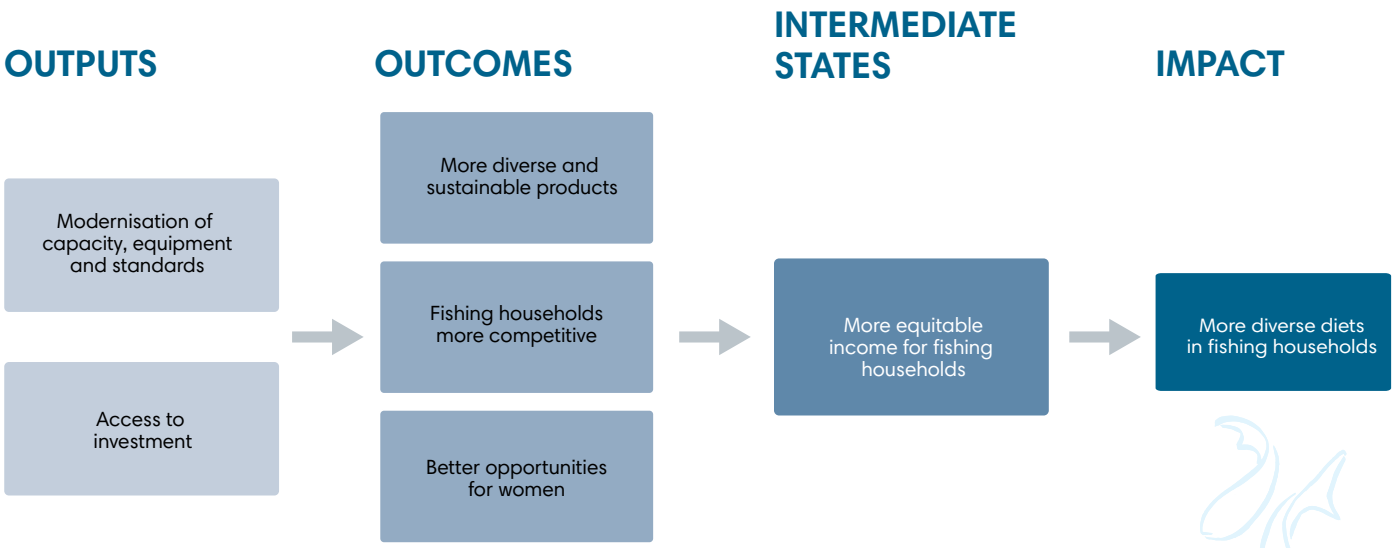
The basic hypothesis that informs this brief's theory of change and related impact pathways is that that small-scale fishing (SSF) sub-sector has a potentially important role to play in contributing to both better FSN outcomes and the longer-term goal of achieving self-sufficiency in meeting the demand for fish through domestic fish production channels. While there does not appear to be much potential for increasing traditional fish production beyond existing levels, opportunities may lie in underexploited fish stocks and/or mariculture, and improved capture and processing methods. However, in order to achieve this, fishers must become organized into cooperative-type organizations; this will allow them to compete in what is effectively a closed market. Support is also required for the adoption of a culture that sustainably utilises fishery resources. Only then can fishers benefit from inputs/activities and move up the value chain. The impact pathway below highlights how this might be achieved. All interventions address the underlying issues and effects of poverty on fisher households.

IV. Illustrative food system impact pathways for the fisheries sector aimed at improving nutrition outcomes

Develop impact pathways based on sub-sector specific practices to identify existing gaps and opportunities that may contribute to more diverse diets.

The proposed long-term impact of the food supply chain impact pathway is achieving diverse and sustainably harvested fisheries that contribute to improved food security and nutrition for consumers and the socio-economic well-being of fisher households. A number of interventions were identified and grouped according to the main stages of the food supply chain. Short-term outcomes include better trained and organized fishers, greater volume and diversity of fish produced as a result of the use of underexploited fish stocks, and increased household income. The medium-term outcome would be evidence-based options for intervention, demonstrated through a food systems approach that would lead to improved fisher household income; increased consumption of fish protein in Kenya's coastal regions and, by extension, the entire country; and more sustainable fisheries in general. The key to the success of the interventions identified by the food supply chain impact pathway are inputs and production methods (including the protection of breeding grounds and use of legal equipment) that would lead to reduced pressure on existing stocks, resulting in their eventual restoration. Underlying these activities are the critical causal assumptions that a) co-operative societies, whether evolving from existing beach management units or newly created, would be welcomed by fishers; and b) if launched and supported, these societies would be able to successfully compete in the closed market of SSF in Kenya. The success of these interventions also depends on the accessibility and affordability of nutritious foods in the fishers' market environment, as well as their own preferences and choices as to how they spend their additional income. Only if these assumptions are proven to be correct can fishers benefit from the inputs/interventions identified as part of the other two impact pathway analyses conducted for this brief, allowing them to move up the value chain.

Example impact pathway: food supply chain



Source: the authors.

V. Recommendations and evidence gaps

Consolidate theories of change on the impact pathways findings, and provide recommendations for improving nutrition in the sector/ sub-sector.

Recommendation 1

Adopt a sector-wide approach by applying a food systems approach (FSA), supported by the three impact pathways, to Kenya's other priority fishery subsectors.
Kenya is facing significant challenges with respect to meeting its goal of achieving a per capita fish consumption of 10 kg/year by 2030. It is therefore recommended that the potential of the country's aquaculture, as well as its inland capture fisheries on lakes, reservoirs and in the exclusive economic zone, be maximised, with the secondary objective being to reduce or eliminate its need to import frozen fish and other cheaper sources of protein from abroad.

Recommendation 2

Mainstream food security and nutrition (FSN) initiatives into the design of projects supported by international financial institutions. This could be facilitated by gaining the advocacy of the joint FSN task force, comprised of personnel from the Ministry of Health and the Ministry of Agriculture and Fisheries, and could prove to be a powerful and cost-effective tool for getting key messages out to communities and households.

Recommendation 3

Assess the socio-economic trade-offs. The FSA includes the concept of social equity, mostly from the perspective of access to food. Applying an equitable, non-discriminatory criterion to producers and to the application of FSA in Kenya's coastal fisheries would likely result in improved FSN outputs (at least in the short term) and would certainly benefit absentee boat owners/fish suppliers, although there would be little to no benefit for small-scale fishers households.

Evidence gaps

- Assessing trade-offs and how an FSA can better address social equity issues affecting food producers could prove to be a useful line of future research.
- Operations research could be carried out on social and behavioural interventions intended to promote fish consumption and small-scale fishing, such as those to include fish consumption considerations in the food security and nutrition planning and policies for county development plans, and to provide education (on dietary diversity, feeding practices, healthy diets, and hygiene and sanitation) through beach management units, cooperatives, health centres, households, schools and local/regional public awareness campaigns.
- Studies could be conducted to determine the presence of pelagics and other underexploited nutrient-rich fish stocks.

For more information check also:

- Maximizing nutrition in fisheries and aquaculture using a food systems approach. An evidence-based literature review
- Maximizing nutrition in fisheries and aquaculture. A guidance note on impact pathways for mainstreaming nutrition based on a case study from Kenya

To access to all the publications on maximizing nutrition, go to:
www.fao.org/nutrition/policies-programmes